Lobachevskii Journal of Mathematics 2014 vol.35 N4, pages 355-359

Automorphisms of spectral lattices of positive contractions on von Neumann algebras

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Abstract

© 2014, Pleiades Publishing, Ltd. We show that any spectral lattice orthoautomorphism of the structure of positive contractions on a von Neumann algebra, endowed with the spectral order and orthogonality relation, that preserves scalar operators is a composition of function calculus with natural transformation of spectral resolutions given by an orthoautomorphism of the projection lattice. In case of von Neumann algebras without Type I2 direct summand any such a map is a composition of function calculus with Jordan *-automorphism. This result is a parallel to famous Dye's theorem and generalizes so far known results on preservers of the spectral order on matrices and operators. Moreover general spectral lattice automorphism are studied.

http://dx.doi.org/10.1134/S1995080214040222

Keywords

Jordan *-automorphisms, preservers of spectral order, von Neumann algebras